IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Tom Fawcett, et al.	Examiner: Kalpana Bharadwaj
Serial No.:	10/822,066	Group Art Unit: 2129
Filed:	April 8, 2004	Docket No.: 200310087-1
Title:	Identifying Exceptional Managed Systems	

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is filed in response to the Final Office Action mailed June 29, 2007 and Notice of Appeal filed October 1, 2007.

AUTHORIZATION TO DEBIT ACCOUNT

It is believed that no extensions of time or fees are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required (including fees for net addition of claims) are hereby authorized to be charged to Hewlett-Packard Development Company's deposit account no. 08-2025.

I. REAL PARTY IN INTEREST

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

II. RELATED APPEALS AND INTERFERENCES

There are no known related appeals, judicial proceedings, or interferences known to appellant, the appellant's legal representative, or assignee that will directly affect or be directly affected by or have a bearing on the Appeal Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1 – 23 stand finally rejected. The claims are presented as originally filed.

The rejection of claims 1 – 23 is appealed.

IV. STATUS OF AMENDMENTS

No amendments were made after receipt of the Final Office Action. All amendments have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The following provides a concise explanation of the subject matter defined in each of the claims involved in the appeal, referring to the specification by page and line number and to the drawings by reference characters, as required by 37 C.F.R. § 41.37(c)(1)(v). Each element of the claims is identified by a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claim element or that these are the sole sources in the specification supporting the claim features.

Claim 1

A method of identifying at least one exceptional managed system amongst a set of comparable managed systems, each managed system having a number of system configuration attributes, the method comprising (Fig. 1 shows a method to the identification of an exceptional managed system among a set of comparable managed systems; p. 3, lines 21-25):

selecting a set of managed systems (Fig. 1, #102; p. 3, lines 26-27; each managed system is described in terms of a number of system configuration attributes; p. 4, lines 9-11);

selecting a set of parameterizations relating to the managed systems (Fig. 1, #104; p. 3, lines 27-28; parameterizations relate to a setting or a series of settings for system configuration attributes; p. 5, lines 10-13);

determining a pattern for each of the parameterizations based on the system configuration attributes (Fig. 1, #106; p. 3, lines 28-30; the pattern characterizes the system configuration attributes that are common among a set of comparable managed systems, for example systems having a same or similar make, model, operating system, hardware configuration; p. 5, lines 17-26);

comparing substantially each of the managed systems to substantially each of the patterns (Fig. 1, #108; p. 4, lines 1-4; the managed systems are compared to the patterns to indicate whether a particular system deviates from a pattern that characterizes the configuration that is common to comparable systems; p. 9, lines 23-28); and

isolating a managed system based on the comparing (Fig. 1, #110; p. 4, lines 4-6; systems that do not conform to the pattern, for example because they are exceptions to a rule generated by the machine learning algorithm, are identified and isolated; p. 10, lines 3-6);

wherein the patterns are determined by a supervised machine learning algorithm (p. 3, lines 30-31).

Claim 3

The method of claim 2, wherein the system configuration attributes include at least one of the following:

operating system patches;

active processes;

installed application software programs;

memory configuration; and

peripheral devices (see p. 4, lines 19 – 30 for examples of system configuration attributes).

Claim 6

The method according to claim 1, wherein the set of parameterizations includes at least one parameterization relating to operating system patches (p. 9, lines 1-11).

Claim 8

The method according to claim 1, further comprising assigning a priority value to an isolated system (p. 10, lines 23-25; p. 11, lines 12-14).

Claim 11

The method according to claim 1, wherein the supervised machine learning algorithm is a rule learning algorithm (p. 8, lines 8-14).

Claim 14

A system for identifying exceptional managed systems amongst comparable managed systems, each managed system having a number of system configuration attributes, the system comprising (Fig. 2 shows application of a method of an embodiment of the invention to a plurality of systems x; p. 13, lines 15-17):

a selection component that selects a set of managed systems (Fig. 2, #202; nominate a set of managed computer systems x having a variety of system configuration attributes; p. 13, lines 17-22);

a supervised machine learning algorithm that determines patterns for a set of parameterizations representing constraints on the system configuration attributes for the selected set of managed systems (Fig. 2, #208; use a supervised rule-learning algorithm to develop a pattern m for each parameterization p; 13, lines 23-24; a set of parameterizations are identified; p. 14, lines 1-3);

a comparison component that compares the managed systems to the patterns (Fig. 2, #212; compare system specific attributes with pattern m for each system z and note significant deviations d; p. 14, lines 9-16); and

an isolating component that isolates the managed systems that deviate from the patterns as exceptional managed systems (Fig. 2, #214; prioritize deviant parameters d assigning the most significant deviations higher priority; p. 14, line 16 – p 15, line 19).

Claim 22

A system for identifying exceptional managed systems amongst comparable managed systems, each managed system having a number of system configuration attributes, the system comprising (Fig. 2 shows application of a method of an embodiment of the invention to a plurality of systems x; p. 13, lines 15-17):

means for selecting a set of managed systems (Fig. 2, #202; nominate a set of managed computer systems x having a variety of system configuration attributes; p. 13, lines 17-22);

means for determining patterns for a set of parameterizations representing constraints on the system configuration attributes for the selected set of managed

systems, according to a supervised machine learning algorithm (Fig. 2, #208; use a supervised rule-learning algorithm to develop a pattern m for each parameterization p; 13, lines 23-24; a set of parameterizations are identified; p. 14, lines 1-3);

means for comparing the managed systems to the patterns (Fig. 2, #212; compare system specific attributes with pattern m for each system z and note significant deviations d; p. 14, lines 9-16); and

means for isolating managed systems that deviate from the patterns as exceptional managed systems (Fig. 2, #214; prioritize deviant parameters d assigning the most significant deviations higher priority; p. 14, line 16 – p 15, line 19).

Claim 23

Computer data storage media having programmed thereon computer software which performs the following functions (Fig. 1 shows a method to the identification of an exceptional managed system among a set of comparable managed systems; p. 3, lines 21-25):

selecting a set of managed systems, each managed system having a number of system configuration attributes (Fig. 1, #102; p. 3, lines 26-27; each managed system is described in terms of a number of system configuration attributes; p. 4, lines 9-11);

selecting a set of parameterizations relating to the managed systems (Fig. 1, #104; p. 3, lines 27-28; parameterizations relate to a setting or a series of settings for system configuration attributes; p. 5, lines 10-13);

determining a pattern for each of the parameterizations based on the system configuration attributes (Fig. 1, #106; p. 3, lines 28-30; the pattern characterizes the system configuration attributes that are common among a set of comparable managed systems, for example systems having a same or similar make, model, operating system, hardware configuration; p. 5, lines 17-26);

comparing substantially each of the managed systems to substantially each of the patterns (Fig. 1, #108; p. 4, lines 1-4; the managed systems are compared to the patterns to indicate whether a particular system deviates from a pattern that characterizes the configuration that is common to comparable systems; p. 9, lines 23-28); and

isolating an exceptional managed system based on the comparing (Fig. 1, #110; p. 4, lines 4-6; systems that do not conform to the pattern, for example because they are exceptions to a rule generated by the machine learning algorithm, are identified and isolated; p. 10, lines 3-6);

wherein the patterns are determined by a supervised machine learning algorithm (p. 3, lines 30-31).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-23 are rejected under 35 USC § 102(e) as being anticipated by US publication number 2004/0243692 (Arnold).

VII. ARGUMENT

The rejection of claims 1 – 23 is improper, and Applicants respectfully request reversal of these rejections.

The claims do not stand or fall together. Instead, Applicants present separate arguments for various independent and dependent claims. Each of these arguments is separately argued below and presented with separate headings and sub-heading as required by 37 C.F.R. § 41.37(c)(1)(vii).

Claim Rejections: 35 USC § 102(e)

Claims 1-23 are rejected under 35 USC § 102(e) as being anticipated by US publication number 2004/0243692 (Arnold). Applicants respectfully traverse this rejection.

A proper rejection of a claim under 35 U.S.C. §102 requires that a single prior art reference disclose each element of the claim. See MPEP § 2131, also, *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983). Since Arnold does not teach each element in the claims, these claims are allowable over Arnold.

Overview of Arnold and Claims

As a precursor to the arguments, Applicants provide an overview of Arnold and the pending claims.

Storage allocation is a process that involves configuring and initializing data storage devices and mapping parts of the storage areas on those storage devices (see Arnold at paragraph [0002]). Many devices (such as physical storage media, storage area networks, switches, adapters, etc.) need to be adjusted during the storage allocation process. Arnold teaches methods to automate the steps involved in storage allocation (see Arnold summary of the invention).

In contrast to Arnold, Applicants' claims are directed to methods and systems of identifying an exceptional managed system among a set of comparable managed systems. Each managed system has a number of system configuration attributes, such as operating

system (OS) platform, OS patches, applications installed, hardware settings, etc. First, parameterizations relating to the managed systems are selected. Parameterizations relate to a setting or a series of settings for system configuration attributes. Then, a pattern is determined for each of the parameterizations based on the system configuration attributes. For example, the pattern characterizes the system configuration attributes that are common among the managed systems. The managed systems are compared to the patterns to indicate whether a particular system deviates from a pattern that characterizes the configuration. Managed systems are then isolated based on the comparison. Systems that do not conform to the pattern, for example because they are exceptions to a rule generated by a machine learning algorithm, are identified and isolated. The patterns are determined by the machine learning algorithm.

Arnold Not Teach Claim Elements

The independent claims recite numerous elements that are not taught in Arnold. Some examples are provided below with respect to specific language appearing in claim 1.

As one example, claim 1 recites "determining a **pattern** for each of the parameterizations based on the system configuration attributes" (emphasis added). The Office Action equates the constraints in paragraph [0044] in Arnold with the claimed "parameterizations." Therefore, the issue is: Does Arnold teach determining a pattern for his constraints? No, Arnold does not.

Arnold does not even mention determining patterns for parameterizations or constraints. Arnold is silent as to determining patterns. The Office Action cites paragraph [0023] in Arnold. This paragraph discusses a management unit that obtains configuration information and usage metrics to execute commands and functions that it deems appropriate. Paragraph [0023] does not mention or even suggest determining patterns for parameterizations or constraints. **Arnold does not even discuss the use of patterns.**

Anticipation under section 102 can be found only if a single reference shows exactly what is claimed (see *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985)).

For at least these reasons, the claims are allowable over Arnold.

As another example, claim 1 recites "comparing substantially each of the managed systems to substantially each of the patterns." Nowhere does Arnold discuss making comparisons of managed systems to patterns for parameterizations based on system configuration attributes. Again, Arnold does not each discuss patterns, let alone making comparisons of patterns with system configuration attributes.

The Office Action cites paragraphs [0045] and [0049]. Paragraph [0049] discusses comparing observed (i.e., monitored) storage attributes with a quality of service. Nowhere, however, does Arnold teach comparing patterns with system configuration attributes. **Arnold does not even discuss the use of patterns.**

For a prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference (see *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990)).

For at least these reasons, the claims are allowable over Arnold.

As yet another example, claim 1 recites that the "patterns are determined by a supervised machine learning algorithm." The Office Action **admits** that Arnold does not teach a machine learning algorithm. Applicants agree with this admission. The Office Action, however, attempts to cure this deficiency with the principle of inherency. Applicants respectfully disagree.

The Office Action fails to satisfy its burden in rejecting the claims based on inherency. As noted in the MPEP, the Federal Circuit has ruled that:

> To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' MPEP §2112, quoting In re Robertson, 169 F.3d 743, 745 (Fed. Cir. 1999).

Here, no extrinsic evidence has been cited in the Office Action in support of the contention that Arnolds storage system uses machine learning algorithms. Arnold is completely silent on the concept of machine learning algorithms. Arnold does not even contemplate the use of such algorithms. The Office Action has failed to provide a convincing line of reasoning why machine learning algorithms are necessarily present in the storage system of Arnold.

For at least these reasons, the claims are allowable over Arnold.

Dependent Claim 3

Claim 1 recites determining a pattern based on system configuration attributes. Dependent claim 3 then recites that these system configuration attributes include one of OS patches, active processes, installed applications, memory configuration, and peripheral devices. The Office Action cites Arnold at paragraph [0022] for allegedly teaching dependent claim 3. Applicants respectfully disagree.

Paragraph [0022] in Arnold mentions words such as: operating system, adapters, disk drives, memory, etc. Arnold, however, does not discuss determining a pattern based on such devices. In other words, even though Arnold uses the word "operating system," Arnold does not teach determining a pattern based on the operating system.

For at least these reasons, dependent claim 3 is allowable over Arnold.

Dependent Claim 6

Claim 1 recites determining a pattern for parameterizations. Dependent claim 6 then recites that these parameterizations relate to operating system patches. The Office Action cites Arnold at paragraph [0022] for allegedly teaching dependent claim 6. Applicants respectfully disagree.

Paragraph [0022] in Arnold mentions the word "operating system." Arnold, however, does not discuss determining a pattern based on operating system patches. **Arnold does not even discuss OS patches.**

For at least these reasons, dependent claim 6 is allowable over Arnold.

Dependent Claim 8

Dependent clam 8 recites assigning a priority value to an isolated system. The Office Action cites Arnold at paragraph [0045] for allegedly teaching dependent claim 8. Applicants respectfully disagree.

The Examiner states that paragraph [0045] in Arnold teaches determining the capabilities of a storage system in terms of level of performance. This teaching is quite different than the recited element. Claim 8 recites that a priority value is assigned to an isolated system. Arnold never isolates a system and assigns a priority to it. Priorities are not assigned in Arnold.

For at least these reasons, dependent claim 8 is allowable over Arnold.

Dependent Claim 11

Dependent clam 11 recites that the supervised machine learning algorithm is a rule learning algorithm. The Examiner argues that this element is inherent in Arnold. Applicants strongly disagree.

Arnold does not even suggest the use of machine learning algorithms. Under the law, inherency can be found only when it is clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Machine learning algorithms are a particular type of technology not contemplated in Arnold.

For at least these reasons, dependent claim 11 is allowable over Arnold.

CONCLUSION

In view of the above, Applicants respectfully request the Board of Appeals to reverse the Examiner's rejection of all pending claims.

Any inquiry regarding this Amendment and Response should be directed to Philip S. Lyren at Telephone No. 832-236-5529. In addition, all correspondence should continue to be directed to the following address:

Hewlett-Packard Company
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

Respectfully submitted,

/Philip S. Lyren #40,709/

Philip S. Lyren
Reg. No. 40,709
Ph: 832-236-5529

VIII. Claims Appendix

1. A method of identifying at least one exceptional managed system amongst a set of comparable managed systems, each managed system having a number of system configuration attributes, the method comprising:

selecting a set of managed systems;

selecting a set of parameterizations relating to the managed systems;

determining a pattern for each of the parameterizations based on the system configuration attributes;

comparing substantially each of the managed systems to substantially each of the patterns; and

isolating a managed system based on the comparing;

wherein the patterns are determined by a supervised machine learning algorithm.

2. The method of claim 1, wherein the managed systems are computer systems.

3. The method of claim 2, wherein the system configuration attributes include at least one of the following:

operating system patches;

active processes;

installed application software programs;

memory configuration; and

peripheral devices.

4. The method of claim 1, wherein selecting of the set of managed systems includes classification of the systems in accordance with a system attribute.

5. The method according to claim 1, further comprising allocating a resource to any system that has been isolated.

6. The method according to claim 1, wherein the set of parameterizations includes at least one parameterization relating to operating system patches.

7. The method according to claim 5, wherein the set of parameterizations includes at least one parameterization relating to operating patches and the step of allocating a resource to the system includes an analysis of whether at least one operating patch should be installed or removed from a system.

8. The method according to claim 1, further comprising assigning a priority value to an isolated system.

9. The method according to claim 8, further comprising compiling a list of isolated systems and ordering the isolated systems in accordance with their priority values.

10. The method according to claim 8, further comprising allocating a resource in accordance with priority values.

11. The method according to claim 1, wherein the supervised machine learning algorithm is a rule learning algorithm.

12. A method according to claim 1, further comprising annotating an isolated system with a measure indicative of the results of the comparing, wherein the measure is based on at least one of the following:

an extent of deviation from a pattern;

a degree of support for a pattern;

a confidence level of a pattern;

an assessment of the significance of a pattern; or

a cumulative number of patterns from which the system deviates.

13. A method according to claim 12, further comprising compiling a list of isolated systems ordered in accordance with said measures.

14. A system for identifying exceptional managed systems amongst comparable managed systems, each managed system having a number of system configuration attributes, the system comprising:

a selection component that selects a set of managed systems;

a supervised machine learning algorithm that determines patterns for a set of parameterizations representing constraints on the system configuration attributes for the selected set of managed systems;

a comparison component that compares the managed systems to the patterns; and

an isolating component that isolates the managed systems that deviate from the patterns as exceptional managed systems.

15. The system of claim 14, wherein the selection component classifies the set of managed systems in accordance with a system attribute.

16. The system according to claim 14, further comprising an allocation component that allocates a resource to the systems that have been isolated.

17. The system according to claim 14, wherein the set of parameterizations includes at least one parameterization relating to operating system patches.

18. The system according to claim 16, wherein the set of parameterizations includes at least one parameterization relating to operating patches and the allocation component conducts an analysis of whether at least one operating patch should be installed or removed from a system.

19. The system according to claim 14, further comprising a prioritization component that assigns priority values to the isolated systems, compiles a list of isolated systems, and orders the isolated systems in accordance with their priority values.

20. The system according to claim 14, wherein the supervised machine learning algorithm is a rule learning algorithm.

21. The system according to claim 14, further comprising an annotation component that annotates the isolated systems with a measure that indicates the extent to which each isolated system deviates from the patterns.

22. A system for identifying exceptional managed systems amongst comparable managed systems, each managed system having a number of system configuration attributes, the system comprising:

means for selecting a set of managed systems;

means for determining patterns for a set of parameterizations representing constraints on the system configuration attributes for the selected set of managed systems, according to a supervised machine learning algorithm;

means for comparing the managed systems to the patterns; and

means for isolating managed systems that deviate from the patterns as exceptional managed systems.

23. Computer data storage media having programmed thereon computer software which performs the following functions:

selecting a set of managed systems, each managed system having a number of system configuration attributes;

selecting a set of parameterizations relating to the managed systems;

determining a pattern for each of the parameterizations based on the system configuration attributes;

comparing substantially each of the managed systems to substantially each of the patterns; and

isolating an exceptional managed system based on the comparing;

wherein the patterns are determined by a supervised machine learning algorithm.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.